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SHORT NOTES

An interesting mid-Cretaceous ammonite from Hokkaido

(Studies of the Cretaceous ammonites from Hokkaido and Sakhalin-LXXIX)

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Abstract. In this paper a fairly well-preserverd ammonite is shortly described to show its interesting characters. It is provisionally referred to *Bhimaites* and regarded as a new species. Since it is small even at the adult stage and has a probable trace of lappet, it may represent a microconch of a dimorphic pair. It was found solely from the upper part of the Albian in the Soeushinai area of Hokkaido. More material is, however, required to clarify the extent of variation, to confirm the idea of dimorphism and to know the stratigraphic range and geographic distribution of this species.

Key words: Ammonite, *Bhimaites*, dimorphic pair, Hokkaido, mid-Cretaceous

Introduction

Among a large collection of ammonites from the mid-Cretaceous strata of the Soeushinai area, northwestern Hokkaido, there is a small but interesting ammonite which has not been reported previously. This is a short note on it.

Before going further, we greatly appreciate Yoshitaro Kawashita for his keen sight and also for the generous supply of his acquisition to scientific research. Thanks are extended to Tamio Nishida, University of Saga, for his warm help during the course of field and indoor works related to this study; to C.W. Wright for his kindness in reading an earlier draft with linguistic improvement; to Kazuko Mori for her assistance in preparing the manuscript.

Palaeontological description

Genus ***Bhimaites*** Matsumoto, 1954

Type species.—*Ammonites bhima* Stoliczka, 1865 (by original designation, Matsumoto, 1954, p. 113).

Remarks.—Because of the degree of morphological similarity, *Bhimaites* could be ranked among the subgenera of *Puzosia* Bayle, 1878. It contains several species of Albian and/or Cenomanian age. A few species have been recorded from the Turonian and possibly from the Coniacian. From the standpoint of phylogenetic divergence, the generic status of *Bhimaites* is kept at least for the time being (see Matsumoto, 1988, p. 21)

Species of *Bhimaites* are rare in the Cretaceous of Japan. *B. takahashii* Matsumoto (1988, p. 107, fig. 47) was a sole example from the mid-Turonian *Inoceramus hobetsensis* Zone in the Obira area (northwestern Hokkaido). Here is another rare but interesting new species which is provisionally referred to *Bhimaites* with a query.

Bhimaites ? ***kawai*** sp. nov.

Figures 1-3

Material.—GK. H8490 (=YKC061111) from the laminated sandstone (feldspathic wacke) at locality R813 on the River Sounnai from the uppermost part of Member My2, Middle Yezo Group (see Nishida *et al.*, 1996, fig. 2 and fig. 10). This is the holotype. We have endeavored to get more material, but so far we have not been successful.

Diagnosis.—Shell small and discoidal, with moderate involution (about 3/5) and umbilical ratio (1/3). Whorls increasingly compressed with growth. Outer whorl narrowly oval in section with the maximum breadth at one third of height, from where the outer flanks converge gently to arched venter, while the inner flanks are bent abruptly to low but nearly vertical umbilical wall.

Phragmocone nearly smooth. Body chamber occupies about three-quarters of the last whorl. Constrictions fairly frequent on the body chamber, flexuous on the main part of the flank and much projected from the ventrolateral shoulder to the venter. On each interspace of the constrictions a few weak furrows may run roughly subparallel with the constrictions.

Suture rather simple; L as deep as E and rather asymmetric; U2 much smaller than L and tripartite; auxiliaries still smaller and regularly descending.

Specific name.—This species is dedicated to Kawa-san [Mr. Kawa], a friendly nickname of Yoshitaro Kawashita, who found the holotype.

Figure 1. *Bhimaites ? kawai* sp. nov. Holotype. GK. H8490 [=YKC061111] from locality R813, Member My2 of the Soeushinai area. **1.** left lateral (a), frontal (b), sectional (c), back (d) and right lateral views, ×1.7. **2.** left lateral view of the same specimen in different light before cleaning the umbilicus, ×1.5; arrow: last septum. Bar scales: 10 mm for each of Figs. 1-1, 1-2.

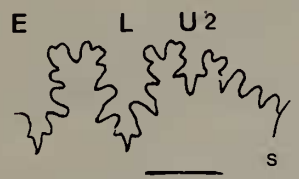

Figure 2. *Bhimaites ? kawai* sp. nov. The last third suture (external) of the holotype. E, L. U2: external, lateral and 2nd umbilical lobes; s: umbilical seam. Bar scale: 1 mm.

Dimensions.—See Table 1.

Observation.—The holotype is the sole material which is at present available for this species. Although its body chamber is fairly long, the actual apertural margin is not preserved. The trace of the faint furrow in front of the constriction shows a slightly more pronounced lateral convexity than that of the constriction. This seems to suggest the possible existence of a lappeted peristome. For the reason of the small size and the above observation, the holotype may represent a microconch. To confirm this presumption, examples of corresponding macroconchs should be searched out. It is noted that the holotype has a somewhat larger umbilical ratio (U/D) than that of the typical species of *Bhimaites*. This may be due to its small size, corresponding to a juvenile of a normal species of *Bhimaites*. Such a presumption should be examined by a find of macroconchs of this species.

Comparison and discussion.—In the previous literature, there is no species with which the present specimen can be

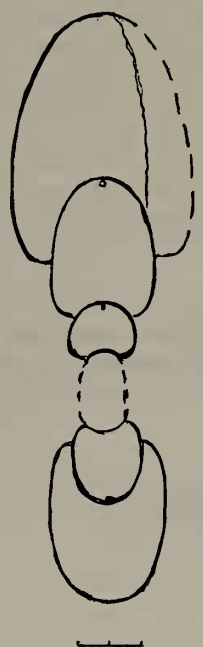

Figure 3. *Bhimaites ? kawai* sp. nov. Cross-section (sketch) of the holotype. Bar scale: 2 mm. While the umbilicus was under cleaning, the specimen was cross-cut into halves and the section was sketched. The trace of the fissure may be seen in Figure 1-1a.

Table 1. Measurements of *Bhimaites ? kawai*.

Specimen	D	U	U/D	H	H/D	B	B/D	B/H	H/h
Holotype (E)	16.4	5.4	.33	6.8	.41	4.5	.28	.66	1.33
〃 (E-180°)	12.3	4.0	.33	5.1	.41	3.4	.28	.67	1.31

D=diameter, U=width of umbilicus, H=whorl-height, B=whorl-breadth, h=whorl-height at half a whorl adapical from H; E=preserved end, E-180°=at half a whorl adapical from E. Measurements of linear dimensions are in mm.

identified. The specimen from the presumed Lower Cenomanian of England, described as *Puzosia* (? *Bhimaites*) sp. by Wright and Kennedy (1984, p. 59, pl. 4, fig. 4 ; text-fig. 2) has compressed whorls and prorsiradiate constriction. It is, hence, somewhat similar to the Hokkaido specimen described above. It is still septate at its preserved end at a larger diameter (nearly 30 mm) than ours and is less compressed (B/H=0.87 as compared with 0.67 of our holotype) despite its later growth stage. The illustrated suture of the British specimen is rather of a *Puzosia* pattern, whereas that of ours is dissimilar to it, showing a somewhat peculiar feature.

The holotype of *Puzosia decemsulcata* Collignon (1964, p. 56, pl. 332, fig. 1495), from the "Lower Cenomanian" of Madagascar, has frequent constrictions which are prorsiradiate and slightly flexuous on the main part of the flank and markedly projected from the ventrolateral shoulder to the venter. In this respect it is fairly similar to our species, but it is larger (still septate at D=90 mm) and has a larger ratio B/H [0.78] than that of our species. Collignon's species may be referable to *Bhimaites*, but a final conclusion should be deferred, until it is defined more clearly.

As in the case of *Microdesmoceras tetragonum* Matsumoto and Muramoto in the Desmoceratinae (see Matsumoto *et al*., 1972), this species might represent a progenetic dwarf offshoot of *Puzosia*, but we hesitate to propose a new subgenus for the reason of insufficient evidence.

Occurrence.—As for *Material*. Member My2 is referred to the upper part of the Upper Albian (see Nishida *et al*., 1996). The true stratigraphic range and geographic distribution of this species should be determined by further investigations.

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Fukuoka 福岡, Hokkaido 北海道, Obira 小平, Saga 佐賀, Soeushinai 添牛内, Sounnai 早雲内, Yoga-cho 与賀町